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Technology Update

Southern Region, USDA Forest Service, 1720 Peachtree Rd., N.W., Atlanta, Ga. 30367

Southern Pine Beetle Fact Sheet Number 21

SILVICULTURE: A MEANS OF REDUCING LOSSES FROM THE SOUTHERN PINE BEETLE

Unhealthy stands are highly susceptible to attack by the southern pine beetle (SPB). This familiar and basic principle applies regardless of region or pine type. Regional rating systems have been developed to identify high-hazard stands (see Southern Pine Beetle Fact Sheet Number 10). Silvicultural practices provide the best means to prevent or reduce the susceptibility of stands to beetle attack.

Preventive Silviculture.—Several silvicultural options are available that may be helpful in developing prevention strategies to reduce SPB losses. No "standard" recommendations will apply to all situations. Because each forest condition and locality presents different management problems, each probably requires a different combination of practices to increase resistance to SPB attack. The following guidelines have been developed to reduce the potential for SPB losses:

- Favor tree species that are most resistant to SPB attack and best-suited to the site. Slash pine, longleaf pine, Virginia pine, and eastern white pine tend to be more resistant to SPB attack than are loblolly pine, shortleaf pine, or pitch pine.

- Salvage trees damaged by lightning, wind, ice, and other destructive agents. Pines struck by lightning offer a favorable environment for the SPB and several species of *Ips* beetles. Pine stands damaged by wind, ice and hail are more susceptible to attack than are undisturbed stands.

- Thin stands to reduce competition and remove slow-growing trees that are subject to SPB attack. The degree of thinning should be determined by

the intensity of management, the kind of product desired, the available markets, and the natural conditions specific to each location. Basal areas of 80 to 100 square feet per acre are recommended to reduce the hazard from beetles, while maintaining good stocking and encouraging rapid growth and good tree vigor.

- Manage a mixture of pine and hardwood species because the SPB prefers pure pine stands. A mixture of pine and hardwood species reduces the potential for occurrence of beetle spots and subsequent damage.

- Use harvesting systems that minimize logging damage. Logging activity has a tendency to increase bark beetle attacks. Mechanical injury to above- and below-ground portions of residual trees also provides attack sites for black turpentine beetles.

- Harvest mature and overmature stands. Susceptibility of stands to SPB attack increases with age. Overmature stands are characterized by slow radial growth, flat-topped crowns, and sparse foliage. These trees seldom respond to intermediate cuttings and should be replaced with a more resistant pine species or a species mix suited to the area.

- Protect the site as much as possible. High-hazard sites in the Piedmont are characterized by a high percentage of clay in the surface and subsurface soil horizons. Infestations in the Coastal Plain occur more often on wet and water-logged sites than on well-drained sites. Abuse of these delicate sites could further increase SPB problems.

Planning—Silvicultural activities related to forest pest management are generally neglected during periods of low beetle activity. Yet, this is the time when the planning and use of prevention strategies should be the greatest. High-hazard stands can be identified and treated to reduce their susceptibility to beetle attack. When beetles are not a problem, mill quotas include very little salvage wood, and operators are available to make intermediate cuttings. Also, endemic reservoirs of SPB-infested trees and high-risk trees can be located and scheduled for removal. The probability of SPB spot initiation and spread is lowest when insect populations are down. Low-hazard stands can be tended to maintain vigor and rapid growth.

The practice of silviculture involves harvesting, regenerating, tending, and protecting the crop. Treatments are assigned according to economic considerations and management objectives. Silvicultural practices to promote long-term resistance to SPB attack can be in harmony with these goals.

Application—Stands should be managed to prevent or reduce losses from disease and insect pests. Studies have shown a close association between annosus root rot and SPB attack. Take precautions to reduce the danger of annosus infection. South of 34° N latitude, intermediate cuttings to remove trees that are subject to a high hazard of SPB attack or to promote stand vigor should be scheduled during the summer. In that period fewer annosus spores are produced and high temperatures kill those that are produced. On high-hazard annosus sites, treat stumps with Phlebia (formerly Peniophora) spores in diseased stands to reduce the incidence and spread of infection.

Stands with symptoms of littleleaf disease are generally high-hazard SPB areas. "Locus" trees --

those first attacked and preferred by the SPB -- are often dominant and codominant shortleaf pine trees. They have large, live crown ratios and root systems in incipient stages of decline. Trees in advanced stages of littleleaf decline are seldom attacked by the SPB. Salvage cuttings are recommended to utilize both littleleaf and SPB-attacked trees. Stands with littleleaf disease should be regenerated before they reach advanced stages of decline, usually between the ages of 30 and 40. Loblolly pine is not as susceptible as shortleaf pine to littleleaf disease, and should be favored when regenerating stands.

Salvage trees heavily infected with fusiform rust galls. Diseased stems are subject to breakage by wind and ice, and may be infection courts for numerous insects and diseases. Cuttings will lower the potential for attack and spread of insect pests and provide cash returns from the harvested trees.

Stands and forests that are highly resistant to SPB attack should also be resistant to attack by other bark beetles. Maintaining healthy stands is the key to integrated pest management.

For further information, contact your State forestry agency or: USDA Forest Service, Forest Pest Management Staff, 2500 Shreveport Highway, Pineville, La. 71360 (telephone 318/473-7160). Or: USDA Forest Service, Forest Pest Management Staff, 200 Weaver Boulevard, Asheville, N.C. 28804 (telephone 704/259-0625).

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